

coupling-joints K are of the ordinary construction, and I find them well adapted to the purpose for which they are here designed, though other styles of universal coupling-joints may be used in place of them without departing from my invention.

The sleeve L has, preferably, a central longitudinal square opening made through it, and an end of the shaft-section *c* is firmly held therein by set-screw C' or other suitable device, while the end of the shaft-section *d* plays loosely back and forth in said sleeve L, thereby giving additional flexibility to the line G of shaft-connections.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a locomotive, the combination, with the engine and the bogie-wheels having bevel-teeth on their sides, of a horizontal and longitudinal shaft having bevel-gears meshing with said teeth, the said shaft having in its length a universal joint for the purpose of taking up vertical oscillation, and having also a direct connection with the engine, as described.

2. In a locomotive, the combination, with the engine and the bogie-wheels having bevel-teeth on their sides, of a horizontal and longitudinal shaft having bevel-gears meshing with said teeth, the said shaft being connected to the engine and having in its length an

extension-joint, which secures a rigid revolution, but permits end-play for turning curves, as described. Geared Steam Locomotive Works

3. As a means of transmitting power from a locomotive-engine to the locomotive-drivers, the double-crank shaft F', beveled-gear wheel F, shaft-connection lines G, and bogie-axle gear-wheels E E, arranged and operating substantially as herein shown and described.

4. In a locomotive, the combination, with the piston-rod and connection B' B² and axles D D, of the crank-shaft F', bevel-gears F F, shaft-sections *b c d f*, universal coupling-joints K, coupling-sleeves L, pinions I M, and bevel-gear wheels E E, substantially as and for the purpose described. www.gearedsteam.com

5. In the construction of the shaft-connection lines G, for transmitting motion from the engine to the drivers of a locomotive, the shaft-section *b*, carrying the pinion I, universal joint K, coupling-shaft sections *b c*, shaft-sections *c d*, coupled by sleeve L, the section *d* being longitudinally movable in said sleeve L, universal joint K, coupling-shaft sections *d f*, and shaft-section *f*, carrying pinions M M, arranged as herein shown and described.

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Witnesses:

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